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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,704	05/24/2004	Alex Colvin	81100109	3703

46535 7590 12/22/2006

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2855	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
2 MONTHS	12/22/2006	PAPER

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/709,704
Filing Date: May 24, 2004
Appellant(s): COLVIN ET AL.

David S. Bir
For Appellant

EXAMINER'S ANSWER

This is in response to the Appeal Brief filed on Oct. 16, 2006 appealing from the Office action mailed Feb. 15, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The Examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The Appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is deficient. 37 CFR 41.37(c)(1)(v) requires the summary of claimed subject matter to include: (1) a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number, and to the drawing, if any, by reference characters and (2) for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function as permitted by 35 U.S.C. 112, sixth paragraph, must be identified and the structure, material, or acts described in the specification as corresponding to each claimed function must be set forth with reference to the specification by page and line number, and to the drawing, if any, by reference characters.

The brief is deficient because the Appellant's summary goes well beyond being a summary of the *claimed* subject matter. Instead, the Appellant has pointed to many limitations which are present in the Appellant's specification but have no nexus with the Appellant's actual claim language. For example, the Appellant argues the meaning of a flow restriction element or screen by elaborating on the details thereof as set forth in the specification, but looking at independent claim 1, the Appellant has not claimed any such meaning. Instead, the Appellant has only set forth the word *screen* and nothing more.

(6) Grounds of Rejection to be Reviewed on Appeal

The Appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,837,903	WEIGAND	11-1998

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 12-21, 23-27, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Weigand (5,837,903).

With respect to independent claim 1, Weigand teaches a method for real-time determination of exhaust gas flow through an exhaust pipe of a vehicle (Fig. 1), the method comprising:

measuring a pressure difference upstream (see pressure port 22) and downstream (see pressure port 24) of a screen (18);

measuring exhaust gas temperature (see port 23; col. 4, lines 26-29); and

determining the exhaust gas flow based on the pressure difference and the temperature (col. 2, lines 59-63).

With respect to claim 12, Weigand discloses the screen (18) covering more than half of the exhaust pipe (Fig. 1) and thus suggests that the screen covers *substantially* the entire area of the exhaust pipe as claimed (Fig. 1).

With respect to claim 13, the screen mesh (18) of Weigand is interpreted as generating a measurable pressure difference (ie. a pressure difference is measured between port 22 and port 24) while minimizing back pressure and the formation of condensation on the screen because not minimizing the back pressure and the formation of condensation would defeat the purpose of the screen (18) since both conditions are very undesirable conditions in an exhaust system.

With respect to claim 14, Weigand suggests a screen which includes *about* six strands per inch arranged in a generally rectangular array that extends across the exhaust pipe as claimed (see Fig. 2) because the claim does not define the meaning of the word *about* keeping in mind that a typical exhaust pipe is between 2.5 and 3 inches in diameter.

With respect to independent claim 15, Weigand teaches a system for determining exhaust gas flow of a vehicle, the system comprising:

a tube (12) adapted for placement on an exhaust pipe of the vehicle, the tube including a flow restricting element (18) extending *substantially* (see above comments with respect to claim 12) entirely across a cross-sectional area of the tube, a first port (22) disposed upstream of the flow restricting element (18) for measuring a first pressure, and a second port (24) disposed downstream of the flow restricting element (18) for measuring a second pressure; and

a device in communication with the tube for determining the exhaust gas flow based on a difference between the first and second pressures (see the computer as described in col. 2, lines 59-63).

The Examiner notes that the word "*portable*" in the Appellant's preamble of claim 15 has not been given patentable weight because the body of the claim does not rely upon such a term for completeness.

With respect to claim 16, Weigand set forth a third port (23) for measuring temperature of exhaust gas as claimed.

With respect to claim 17, Weigand set forth a thermocouple extending through the third port and in communication with the device to measure temperature of the exhaust gas flowing through the tube (col. 4, lines 24-29).

With respect to claim 18, Weigand set forth that the device determines the exhaust gas flow based on a difference between the first and second pressures and the temperature of the exhaust gas (col. 2, lines 59-63).

With respect to claim 19, Weigand suggest at least one differential pressure transducer to generate a signal based on the difference between the first and second pressures (col. 2, lines 59-63).

With respect to claim 20, the flow restricting element (18) of Weigand is interpreted as a screen.

With respect to claim 21, Weigand suggests a screen with less than ten strands per inch arranged in a generally square array (see Fig. 2, keeping in mind that a typical exhaust pipe is between 2.5 and 3 inches in diameter).

With respect to claim 23, the flow restricting element (18) of Weigand is interpreted as a disk having regularly spaced openings (Fig. 2) as claimed.

With respect to claim 24, the openings of the disk in Weigand are interpreted as comprising between 60% and 65% of the cross-sectional area of the disk (Fig. 2).

With respect to claim 25, Weigand set forth a microprocessor to determine the exhaust gas flow (col. 2, lines 59-63).

With respect to claim 26, Weigand set forth the tube (12) being straight which will reduce added back pressure as claimed.

With respect to claim 27, due to the number of openings (Fig. 2) in the flow restricting element (18), Weigand is interpreted as including sufficient spaces to limit any increase in back pressure to less than six percent.

With respect to claim 32, Weigand teaches an exhaust gas flow sensor for real-time on-board measurement of exhaust gas flow from a vehicle, the sensor comprising:

a straight tube (12) for connecting to an exhaust pipe of the vehicle, the tube including an interior screen (18) to generate a pressure drop as exhaust gas flows across the screen, an upstream port (22) for measuring pressure upstream of the screen, a downstream port (24) for measuring pressure downstream of the screen, and a thermocouple port (23) for measuring exhaust gas temperature;

a differential pressure transducer in communication with the upstream and downstream ports for generating a signal based on a pressure difference between the upstream and downstream ports (col. 10, lines 65+);

a thermocouple in communication with the thermocouple port for generating a signal based on temperature of exhaust gas flowing through the straight tube (col. 4, lines 26-29); and

a processor for receiving the signals from the differential pressure transducer and the thermocouple and determining exhaust gas flow based on the received signals (col. 2, lines 59-63).

The Examiner notes that the word "*portable*" in the Appellant's preamble of claim 32 has not been given patentable weight because the body of the claim does not rely upon such a term for completeness.

35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4, 7, 8, 22, 29-31, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weigand (5,837,903).

With respect to claims 4 and 7, the claims are not deemed patentable over the prior art because the claims merely set forth a mathematical manipulation for determining exhaust flow which would be within the realm of one have ordinary skill in the art.

With respect to claim 8, the claim is not deemed patentable over the prior art because the claim merely set forth a known mathematical relationship between differential pressure and flow.

With respect to claim 22, Weigand is silent as to the make-up of the entire screen (18). However, the use of stainless steel to make the screen, as claimed, would have been obvious to one having ordinary skill in the art.

The motivation being that stainless steel is a very common and popular material used in the making of exhaust systems and components therein due to the ability to withstand the corrosive nature of exhaust gas.

With respect to claims 29 and 30, Weigand recognizes the need to eliminate condensation but fails to teach a condensation trap as claimed.

However, it would have been obvious to one having ordinary skill in the art to use a condensation trap as claimed in combination with the system as taught by Weigand.

The motivation being that Weigand discloses that the presence of condensation will plug the flowmeters and sampling lines. Thus, a desire exists to eliminate the presence of condensation in the exhaust system.

With respect to claim 31, Weigand teaches three ports to extract samples of exhaust gas as discussed above but fails to teach a fourth port as claimed.

Nonetheless, the addition of one additional port to sample the exhaust gas would have been within the realm of one having ordinary skill in the art armed with said teaching.

The motivation being that since Weigand teaches the use of multiple ports to sample exhaust gas the distinction between three ports and four ports is not deemed as being patentably distinguishable over the prior art since the purpose of the fourth port has not been claimed.

Claim 35 is not deemed patentable over the prior art because the claim merely sets forth a mathematical manipulation to determine the exhaust flow which would be within the realm of one have ordinary skill in the art.

10) Response to Argument

The main point of contention throughout the prosecution history and the main point of contention raised in the Appeal Brief is that of *can element 18 of Weigand be interpreted as a screen?*

Weigand has explicitly set forth that element 18 is a capillary section, and as shown below, that capillary section can be interpreted as a screen as claimed.

The Appellant has provided extensive arguments that the capillary section (or laminar flow element) 18 of Weigand can not be interpreted as a screen. However, the Examiner points out that just because a device is not explicitly termed a *screen*, that device is not forbidden as being interpreted as a screen. The Appellant has not answered why the capillary section (18) can not be interpreted as a *screen* as claimed.

The Appellant has pointed out all of the disadvantages of using such a laminar flow element in place of a stranded or wire screen (ie. weight, thermal capacity, operating range, condensation, etc.). But the Examiner points out that the Appellant has not claimed that the screen is a *stranded* screen or a *wire* screen as argued. Nothing in the Appellant's claim defines the depth of the screen (or "longitudinal dimension" as termed by the Appellant). The Appellant

has chose to only claim the word "screen" and no more. The Examiner points out that screens come in all shapes and sizes.

The Examiner argues that if such a depth of the screen was of a critical nature to the operation of the Appellant's invention such a limitation would have been claimed.

Thus, element 18 of Weigand is interpreted as a screen as claimed. The basis for such an interpretation is that when the exhaust flows in the tube 10 from left to right in Fig. 1, the exhaust encounters what the Examiner will call "a grid" (see Fig. 2) which at that point the exhaust sees only a two dimensional object which is no different than what the exhaust would see if a wired or stranded screen was present. The third dimension of "that grid" is the depth, which the exhaust is in contact with as it passes through, and that depth is longer than a stranded or wired screen, but the Appellant has never set forth any limitation which defines or limits such a depth.

Looking at Webster's Dictionary, a screen is defined as being *something that serves to divide, conceal, or protect*. Element 18 of Weigand is clearly *something that serves to divide*. Thus, element 18 is interpreted as a screen *as claimed*.

The Appellant has chosen to claim only the word *screen* and argue the word screen implies all of the limitations as set forth in the Appellant's specification. The Examiner points out that it is improper to import limitations from the specification into the claims, and that the claims must be given their broadest, yet a reasonable, interpretation. As such, no nexus exists between any such arguments and the actual terminology used in the claims.

As an illustration of the lack of a nexus between the Appellant's arguments and the claimed subject matter, the Examiner points out that the Appellant's arguments cite paragraphs in the specification to support their arguments and not claim limitations.

Next, the Appellant argues that element 18 of Weigand does not substantially extend across the cross-sectional area of the body (12). But then the Appellant states that element 18 covers between 50-60% of the cross-sectional area (bottom of page 5). And as the Examiner has argued, since 60% is greater than half, element 18 is interpreted as covering substantially the entire area of the exhaust pipe as claimed in claim 12.

The Appellant next provides arguments centering on condensation and the use of a heating element in the Weigand teaching. Again the Examiner points out that no nexus exists between the Appellant's arguments and the claimed subject matter. Furthermore, the Examiner points out that the Appellant's claims are open-ended and not restricted to not having such a heating element.

Next, the Appellant argues that the device of Weigand is used with an engine mounted on a test stand. Again, the Appellant's claims are not limited from using a test stand.

Finally, the Appellants argue that Weigand does not disclose a screen having about six strands per inch citing dimensions provided by Weigand. The Examiner disagrees because (1) the dimensions as explicitly stated by Weigand and relied upon by the Appellant are only preferred dimensions and not the required dimensions, and (2) the Appellant has claimed the phrase "*about* six strands per inch" wherein the use of the word *about* allows for approximate dimensions and thus Weigand suggests such dimensions.

For the above reasons, the rejection of the claims as set forth in the final office action of Feb. 15, 2006 should be upheld.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the Examiner in the Related Appeals and Interferences section of this Examiner's Answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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